METHOD FOR SUPPLYING A LABELLING LINE, AND LABEL SUPPORT USED IN SUCH METHOD

The present invention relates to a method of continuously labelling objects, in particular bottles or other forms of packaging, as used in particular in fields as varied as cosmetics, pharmacy, household or agri-foodstuffs. The invention also provides a label support for use with such a method.

In the field of labelling, the labels are generally stuck to one face of a support, made of plastic or paper, which is wound around a core and is used for continuously supplying a supply station where the labels are transferred to the objects to be labelled. At the exit of the supply station, the support is wound around a spool, and thrown away or recycled.

One of the faces of the support is typically covered with silicone so as to make it easy to detach the labels as they pass through the labelling station. Such a support has a thickness which is generally of the order of 50 µm to 60 µm. The labels are generally made of polyethylene, in which case they may have a thickness of from 80 µm to 100 µm. They may also be made of polypropylene, in which case they may have a thickness of from 50 to 60 µm. The label is fixed temporarily to the support by means of an adhesive layer whose thickness may be of the order of 20 µm. A «sandwich» is formed whose total thickness is of the order of 160 µm.

There are a number of drawbacks with such methods. A first drawback relates to the environment, owing to the fact that the support is difficult to recycle once the labels it carries have been removed.

Furthermore, the relatively small number of labels which can be wound on a support requires frequent roll changes, which are expensive in terms of machine time, labour and waste resulting from unused reel ends, in particular because of the requirements relating to automatic reel changes.

Lastly, in order to make the labels, materials such as polyethylenes or polypropylenes require a treatment of the «top coating» or

corona discharge effect type on printing, so as to allow them to be printed optimally and durably.

US-A-5 679 199 describes a labelling method according to which two tapes of labelling material are superimposed and brought into a labelling station where they are separated. Using a laser beam, labels are cut to the required shape and dimensions from each of the tapes thus separated. Before the label is deposited on a suitable object, an adhesive layer of the label is activated using UV or IR. Such a process suffers essentially from the same drawbacks as those mentioned with reference to the prior art devices. The laminate formed by the two superimposed tapes is of significant thickness, which restricts the number of labels per roll. The labels are not affixed to one and/or other of the faces of the support but are formed by the support itself, and are therefore intended to be cut directly from the support. The process is therefore complicated, slow and expensive to carry out.

One of the objects of the present invention is hence to provide a method of continuously supplying a labelling station, allowing the problems discussed above with reference to conventional methods to be solved fully or in part.

In particular, one object of the invention is to provide such a method which makes it possible to substantially reduce the frequency with which rolls are changed in the supply stations of the labelling devices.

Another object of the invention is to make it possible to use materials offering better environmental compatibility.

Yet another object of the invention is to provide a method of supplying a labelling device in which the labels are made of a material identical to the material forming the support on which they are wound.

Yet another object of the invention is to allow the use of materials offering better printability properties in order to make the labels.

Other objects will also become apparent from the detailed description below.

Hence, according to a first aspect of the invention, these objects are achieved by providing a method of continuously supplying a labelling line with objects, in particular bottles, comprising the following steps:

a) in a first supply station, providing a support in the form of a tape which has self-adhesive labels stuck to both faces of it;

b) moving the support so as to pass it through a first labelling station supplied with the said objects, the objects being labelled in the first station by using the labels affixed to the first face of the support; and

c) moving the support so as to pass it through a second labelling station, which may or may not be separate from the first, the objects being labelled in the second station by using the labels affixed to the second face of the support.

The number of labels wound on the support is hence increased substantially, thus restricting the volume of material capable of harming the environment.

Putting more labels on the same support makes it possible to use materials which, although they may be more expensive, offer better properties in particular in terms of the environment.

Furthermore, the thicknesses of the support can be reduced considerably, and for a roll of given diameter this further increases the number of labels which can be deposited on the support. With a total thickness of the support (including the labels) which can thus be reduced by a factor of two or three in comparison with conventional supports, the number of labels arranged on the support can thus be up to five times higher than the number of labels of the supports used in conventional methods.

The support is preferably wound around a spool in the first supply station, so as to form a roll. At the exit of the first labelling station, the support may be wound around a spool so as to be put back into the form of a roll, which will then be positioned in a second supply station intended to supply the second labelling station. As an alternative, it is possible to arrange

for the support, at the exit of the first labelling station, to be moved directly towards the second labelling station.

During the second pass, the roll carrying the labels may be repositioned on the same supply station of the same labelling device as the one used during the first pass. As an alternative, in an industrial structure having a plurality of labelling machines, the roll formed at the exit of the first labelling station may, during the second pass, be positioned on another supply station in order to supply another labelling station.

The labels arranged on the first face of the support may be identical to the labels arranged on the second face of the support.

In this case, the second labelling station is preferably supplied with objects other than those having been labelled during the first pass, each of the objects then being covered then with a single label.

As an alternative, the labels arranged on the first face of the support are different from the labels arranged on the second face of the support, the second labelling station being supplied with the objects having been labelled during the first pass, so that each of the said objects is labelled by means of one label from each of the faces of the support. Hence, in the case of a bottle with two main faces, a first label is arranged on the «recto» of the bottle and a second label on the «verso» of the said bottle.

According to an advantageous feature of the invention, the labels of the first face of the support are offset along the axis of the tape relative to the labels arranged on the second face of the support. Such offset positioning leads to less weakening of the support by the cutting tool during printing. Furthermore, on application, the label of the second face of the support is protected to a greater degree when the label is being separated from the first face of the support, since no fold or other mark is generated on the label of the second face.

Preferably, the axial offset is such that the labels of the first face of the support are substantially centred on the axial space between two adjacent labels of the second face of the support.

According to an alternative to the embodiment above, the labels of the first face are superimposed with those of the second face. This is because, in the case of labels with different format, less weakening of the support by the cutting tool is produced. Furthermore, on application, continuity of the labels of the two faces of the tape is facilitated when changing the reel.

According to another advantageous embodiment, the labels of the first face of the support are arranged «head up», the labels of the second face of the support being arranged «head down». This embodiment is particularly suitable for the configuration of a support carrying, on one side, a label intended for the recto of the object to be labelled and, on the other side, a label intended for the verso of the same object to be labelled. This is because, after the tape is turned around after labelling a first face of the object in a first labelling station with the first label, the second label is in the proper configuration in relation to the second face of the object to be labelled.

The labels are advantageously made of polyethylene terephthalate. Such labels may have a thickness of from 10 to 40 µm, and preferably of from 25 to 36 µm. By reducing the thickness of the label in this way compared with conventional labels, its transparency is substantially increased. Furthermore, the use of polyethylene terephthalate for making the labels makes it possible to do away with treatments on printing, of the corona discharge type or of the «top coating» type in order to improve their printability and the retention of the ink.

The support may consist of a material, in particular paper or thermoplastic, both faces of which are coated with a layer of silicone.

Preferably, the labels are made of a material identical to the material forming the support.

Also preferably, the support is made of polyethylene terephthalate. Polyethylene terephthalate makes it possible to compensate for the loss of rigidity due to the reduced thickness of the support compared with the thickness of conventional supports.

The support may have a thickness of from 10 to 40 µm, and preferably of from 23 to 36 µm. Hence, with an adhesive thickness of from 10 µm to 20 µm, it is possible to produce a support whose total thickness, including the thickness of the two «label layers» can vary from 60 µm to 150 µm, and preferably from 95 µm to 140 µm.

A second aspect of the invention provides a label support intended for continuously supplying a labelling station, the said support being in the form of a tape having a first face and a second face, on the opposite side from the first, characterized in that it has self-adhesive labels stuck to each of the said first and second faces.

The support is preferably made of a material identical to the material forming the said labels. The said material is advantageously a polyethylene terephthalate.

Apart from the arrangements described above, the invention consists of a number of other arrangements which will be explained below, in connection with non-limiting illustrative embodiments described with reference to the appended Figures, in which:

- Figure 1 represents the first pass of the label support through the labelling station;
- Figure 2 represents the second pass of the label support through the labelling station;
- Figure 3 represents a second embodiment of the method described with reference to Figures 1 and 2; and
- Figure 4 illustrates a particular embodiment of a label support according to the present invention.

The labelling device represented diagrammatically in Figure 1 has three main stations: a label supply station 1; a labelling station 2, supplied both with labels and with objects to be labelled; and a station 3 for recovering or re-winding the support from which the labels have been taken.

The label supply station comprises a spindle 9 on which a roll 4 of a PET support 5 is mounted so that it is free to rotate, the two faces of the

support being covered with self-adhesive labels 6, 7 spaced uniformly along the support 5. According to this embodiment, the labels 6 are identical to the labels 7.

The support 5 is sent to the labelling station 2 while following a path dictated by a number of guide rolls 10, 16. The supply station is also supplied with bottles 8, to which the labels are to be affixed. A guide roll 11 positions the label support 5 accurately relative to the bottles 8, so that the label is positioned at exactly the right place on the bottle 8. The support 5 is oriented in such a way that the labels 7 are transferred to the bottles 8 during this first pass. The support 5 then leaves the supply station with one face free of labels and one face carrying the labels 6. After running over the guide rolls 12 and 13, the support 5 is then re-wound on a spindle 14, so as to be put back into the form of a roll 15, the labels 6 of the last winding formed being arranged on the outside of the roll.

Such an assembly is, of course, controlled by a number of motors, mechanisms and machines for synchronizing, guiding and controlling, which are well-known and consequently need no further detailed description. Such mechanisms do not form part of the subject matter of the present invention.

In Figure 2, the roll 15 formed after the first pass through the labelling station 2 is positioned on the delivery spindle 9 of the supply station 1 of the machine in Figure 1. The support 5 is moved to the supply station 2, which is again supplied with bottles 8'. The support is positioned in such a way that the labels 6 come into contact with the bottles 8' and are transferred onto the said bottles. The support 5, having had all its labels removed, is then re-wound at the recovery station 3. The roll 17 formed can then be thrown away or recycled.

As a specific example, the support 5 is formed by a layer of polyethylene terephthalate of about 30 µm. The labels 6, 7 are also made of polyethylene terephthalate, and have a thickness of about 25 µm. Each label

carries an adhesive layer with a thickness of about 15 µm on its face next to the support. The support thus formed has a total thickness of about 110 µm.

Figure 3 illustrates a labelling method in which the labels of each of the faces of the support 5 are applied to objects (which may be identical or different) during one single pass. According to this embodiment, the tape 5 coming from a delivery station 1 is conveyed to a first labelling station 2, supplied with objects 8 to be labelled, in particular bottles. At this labelling station, the labels 7 lying on the first face of the support 5 are affixed on a first face (recto) of a bottle 8. The tape 5 is then conveyed to a station 52 for turning the tape round, where the tape is turned round using a return roll mechanism before supplying a second labelling station 2', where the bottles 8 coming from the first labelling station 2 are presented so as to have a second face (verso) arranged in such a way as to receive the labels 6 presented on the second face of the support. The tape 5, having had all the labels which it was carrying on its two faces removed, is conveyed to a winding station 3. The support 5 is conveyed and guided through the various stations by means of a number of tape-pushing units 53, 55 and tape-pulling units 54, 56. Likewise, label-presence detectors 50, 51 are provided in order to synchronize the various operations. The label is detached from the support, inside the labelling station, by making a relatively tight angle with the support 5, and this is done by means of a component having a sharp edge 57, 58, commonly referred to as «application plate».

According to an alternative to the embodiment discussed with reference to the preceding figure, the second labelling station 2' is supplied with objects separate from those supplying the first station 2. With this assumption, the labels 7 present on the first face of the support are preferably identical to those 6 present on the second face.

Figure 4 represents the support 5 inside a labelling station, at the moment when it engages with the application plate 57. On account of the axially offset arrangement of the labels 6 and 7, when label 7 leaves the support 5 to be transferred to an object (not shown), label 6 bears uniformly

on a flat part of the application plate, and therefore does not run the risk of being creased or damaged. According to this embodiment, the labels 6 are substantially centred on the space between two adjacent labels 7.

In the detailed description above, reference was made to preferred embodiments of the invention. It is clear that variants may be made to them without departing from the spirit of the invention as claimed below.